Wage Differentials in Mexico: an education and economic activity perspective

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Resumen

Se analizan los determinantes de los salarios de los jefes de hogar en México desde una perspectiva laboral que integra elementos de capital humano, sector de actividad económica, tamaño de establecimiento, territorio y otros atributos como sexo y tipo de contrato laboral. Se utiliza la metodología de Heckman para corregir el sesgo por autoselección. Se usan microdatos de la Encuesta Nacional de Ingreso y Gasto de los Hogares de 2008. Los resultados indican que la dotación de capital humano es una variable que explica el incremento de los ingresos del jefe de hogar. Por el lado de la demanda se observa que el tamaño de establecimiento también incide en los ingresos. Los jefes de hogar que mantienen un contrato temporal y de base perciben ingresos superiores a aquellos que no se encuentran en el mismo estatus laboral.

Palabras clave:

- Diferencias salariales
- Capital humano
- Método de Heckman.

Abstract

This paper analyzes the determinants for breadwinners' wage levels in Mexico through a labor perspective that integrates elements of human capital, sector of economic activity, establishment size, territory, as well as other attributes such as gender and type of job contract. We used the Heckman methodology to correct the self-selection bias, while using microdata from Mexico's 2008 National Survey of Household Income and Expenditures. The results indicate that human capital allocation is a variable that explains breadwinners' income increase. From the demand side, it is noted that establishment size also affects income. Individuals who have long term contracts and seniority perceive higher incomes than those who do not enjoy the same employment status.

Key words:

- Wage differences
- The human capital
- Heckman's method.

Introduction

In labor economics, the study of breadwinners' income levels through an approach that encompasses supply side factors related to human capital as well as demand elements associated to the economic sector and size of establishment, has become a domain of study which has been receiving increased attention in the field. Standard literature posits that labor productivity is correlated with the stock of human capital, and this contributes to improved earnings. This theoretical framework gives special importance to demand side factors and it has evolved from pioneering contributions by Becker (1974 and 1993). This theoretical perspective has become the foundation for empirical Mincer-type (1974 and 1995) estimations of earning functions, where schooling and work experience are considered relevant variables in wage determination. However, in the literature some other works have emerged such as Katz and Author (1999) which examine the relative influence of both supply and demand factors in the process of wage determination. Krueger and Summer (1988) also address the same phenomenon, while taking into consideration the employment contract as an element of analysis. Following this analytical vein Palacio and Simon (2002 and 2004) analyze the Spanish economy and argue that in wage determination studies, demand factors must be controlled to avoid incurring significant biases when estimating the yields of individual workers' characteristics.

This paper subscribes to this last analytical framework. With the fundamental goal being to determine breadwinners' wage estimates in Mexico through two models. The first includes work experience as linear and quadratic while introducing a vector of dummy variables which consists of different schooling levels. The second econometric specification corresponds to an extended model which analyzes the effect of wage differentials in the labor supply component related to human capital and the demand factor associated with company size and type of economic activity where the breadwinner is employed. It also examines the impact of types of labor contracts on wages, controlling for gender, location and population strata. The paper aims to contribute to the discussion of the wage gap in Mexico, from an approach that integrates both elements of labor supply and demand through the Heckman two-stage method. For this purpose, we use microdata from Mexico's 2008 National Household Income and Expenditure Survey (ENIGH, acronym in Spanish).

The document is divided in four sections. The first is a review of related empirical literature on the Mexican economy. The second is a brief statistical analysis of some indicators used in different models. The third section describes the econometric estimation methodology and discusses the results. Finally, the fourth section presents the general conclusions derived from the estimation work.

Review of empirical literature

In the particular case of Mexico there are various works that examine wage determinants empirically using microdata related to household members. The proliferation of these works aimed at studying the wage gap and the returns of schooling differ according to sources of information, data structures and econometric estimation methodologies. The work by Cragg and Epelbaum (1995, 1996), analyzes the effect of industrial structures in wage dispersion in the wake of structural reforms carried out in the 1980s, it found that wage dispersion expanded with the implementation of such reforms. For Barceinas and Raymond (2005) the different economic policies have in some way impacted labor conditions, showing processes of divergence across sectors and income, noting that trade liberalization plays an important role in explaining this phenomenon.

For Zepeda and Ghiara (1999), after controlling for gender, region and occupation, it was found that considering new variables does not significantly increase the explanatory power of the model but it helps explain labor remuneration in terms of structural relationships. They present evidence that schooling's rate of return is very similar to that found in other countries, but stating that it presents even greater increases for men than for women. Meanwhile, Rojas, Angulo and Velásquez (2000), with information from the 1992 ENIGH, calculated the generalized least squares estimates using socio-economic variables to assess the economic incentives that may motivate an individual to make a human capital investment. They thereby determined that higher levels of education are associated with higher income levels. In line with this Ampudia (2007) addresses the specific case of Ciudad Juarez for the period of 1987-1998 and argues that workers' wages are explained by significantly higher levels of education, however, raising the fact that many young people enter the labor market before they complete their formal studies, showing that accumulating work experience hereinafter results in a favorable impact on their social welfare.

In Burgos and Mungaray's (2007) view, working with a cross-cutting data structure for the years 1984, 1989, 1992, 1996, 1998, 2000 and 2002 using ordinary least squares and robust standard errors obtained in the presence of heteroscedasticity using White's method (1980), they claim that wage dispersion is higher in manufacturing, trade and services and that there is considerable variability in the coefficients related to the type of region, which may indicate a change in its configuration. For Urciaga and Almendarez (2008) an econometric strategy consists of estimating a basic and extended equation that considers a breakdown of educational levels in thirteen cities in northern Mexico, with information from the 2002 National Survey of Urban Employment (ENEU, acronym in Spanish). The restricted version of the model suggests that education returns are greater for men than for women, while the extended model covering other attributes concluded that higher earnings are associated with higher educational

levels (graduate). Ordaz (2007), also using ENIGH data for the period 1994-2005 implemented the Heckman (1979) methodology, to eliminate the self-selection sample bias problem. His results suggest that there are differences in education rates of return when considering gender, as education returns for rural women are higher than those for urban women. With information from the ENEU for the period 1994-2001, Cabrera et al. (2008) estimated an earnings function using panel data and warns that schooling is a relevant variable in determining income for workers in the cities of Tijuana and Mexicali, implying a high demand for education in the local labor market. They raise the need for constantly strengthening the link between production centers and primary, secondary and tertiary education. From a regional perspective, Castro and Morales (2011) mention that the gap in regional inequality has fallen since 1995 in parts of Mexico but stating that it has also increased among some of them.

Description of indicators and analysis of variance

The results of the ENIGH-2008 in terms of household income and expenditure in Mexico reveal that payments for current subordinated work quarterly household average total income improved slightly compared to that recorded in 2000, 2002, 2004 and 2006 reaching $18,318 pesos (US$1,425). In 2006 to 2008 this sector registered a positive variation of 0.6%, but as it turns out, it was less than the 5.6% and 5.3% for the 2002-2004 and 2004-2006 periods, respectively. This shows that there was a decline in the levels of income that could be correlated to the effects of the recent global economic crisis, where indicators of economic activity shrank. Within the 2008 current income category earnings for subordinated work were the most significant item as they represented 62.3% of total. The rest corresponds to self-employed earnings, other job related earnings, property income, transfers and other revenue streams.

For 2008, 80.1% of earnings are monetary, 19.9%are non-monetary. In relation to average quarterly total current expenditure per household the survey reveals that spending on different items experienced a contraction compared to 2006, however, the composition of spending remains practically stable. The survey showed that the majority of household spending in Mexico is directed towards the purchase of food, beverages and tobacco, representing 33.6%. Followed by spending on transportation and communications with 18.4%; education and recreation 13.5%; housing and fuel 10%; personal care 7%; household goods and services 6%; clothing and footwear 5.3%; healthcare 3.1%; and transfer expenditure 3.1%. As may be seen, the healthcare expenditure is significantly low and shows a drop in real terms of 33% compared to 2006.

From the sample used in the econometric estimations a cross analysis of variables was performed which stated that 7.9% of breadwinners in house-

holds analyzed had a temporary contract or for a specific task, while 25% are hired under contract, full time or for indeterminate hours. The rest declares not be sure of what type of contract they have, which is a factor of uncertainty and lack of information regarding the status of workers in the labor market. Moreover, it was observed that breadwinners with higher education levels live in urban locations with over 100 thousand inhabitants; while those with a lower educational level live in rural areas, with less than 2,500 inhabitants, according to the survey. 49.2% of breadwinners live in municipalities with over 100,000 inhabitants, 16.2% in areas ranging from 15,000 to 99,000 inhabitants, 11.7% in towns comprising of 2,500 to 14,999 inhabitants, 22.6% are located in communities with less than 2,500 inhabitants, and 0.03% of cases did not answer.

In the sample analyzed, men tend to have higher schooling levels. Out of 21,599 cases analyzed, 17,886 were men and 3,713 were women. For men, most have primary schooling, secondary and tertiary. In determining the sample size a selection criterion used was the breadwinner and his or her primary job. Once we knew the general characteristics of household income and expenditures and some key variables, and cross comparisons had been performed, we proceeded to do an analysis of variance with a factor to look for wage differences. This exercise was carried out as a preliminary procedure to a regression analysis detailed in a later section. The model ANOVA (Analysis of Variance) with one factor is represented as Xij= u+Ai+uij where Xij denotes the response value of the corresponding variable to the j-th observation of the i-th factor level A and uij which are independent normal variables with a mean of zero and a standard deviation of Ð for all i. The variable of interest is work remuneration and schooling factor is treated as a categorical variable. According to the statistical F and Levene, with probabilities of 0.000 respectively, rejecting the hypothesis of equality of means and variances in income for different levels of schooling, so determining that there are wage differences according to educational level. Pardo and Ruiz (2005) suggest that robust Brown-Forsythe and Welch statistics constitute an adequate alternative to the F statistic when it is not possible to assume that population variances are equal. If probabilities are lower than 0.05, we reject the hypothesis of equal means thus determining categorically that breadwinners income levels with different levels of education are different. Upon performing a factor analysis based on establishment size and type of employment contract, we also determined based on the evidence the incidence of wage gaps, however, these seem to be lower than those obtained when the schooling factor was considered.

Estimation methodology and discussion of results

Model specification and description of variables

The equations estimated in this paper take the traditional specification provided by Mincer (1974) as a reference, however, they are extended models incorporating other attributes related to the breadwinner and labor market factors. The first model is characterized by introducing a vector of dichotomous variables for each level of education and thereafter another model is estimated which captures other socioeconomic, demographic and territorial attributes that enhance the analysis of income determinants under a labor supply and demand approach. The two models estimated are:

$$\ln W_i = \alpha + \delta_1 Exp_i - \delta_2 Exp_i^2 + \sum_{i=1}^{9} \beta_i Esc_i + \mu_i \quad [1]$$

$$\ln W_i = \alpha + \delta_1 Exp_i - \delta_2 Exp_i^2 + \sum_{i=1}^{9} \beta_i Esc_i + \partial sex_i + \sum_{i=1}^{3} \sigma_i estrato_i + \sum_{m=1}^{2} \pi C_i + \sum_{i=1}^{3} \phi_i tamemp_i + \sum_{i}^{6} \theta_i \, \mathrm{sec}tor_i + \sum_{i=1}^{31} \delta_i E_i + \mu_i \quad [2]$$

Where lw_i denotes the natural logarithm of the breadwinner's real hourly earnings Exp_i and Exp_i^2 represents potential work experience because actual experience is not observable in the ENIGH (2008) databases. The variable *sex* represents gender and assumes a dichotomous character taking a one value if the breadwinner is male and zero if she is female. The inclusion of this variable allows to assess whether there are differences in income based on gender. The term $\sum_{i=1}^{9} \beta_i Esc_i$ defines a vector of dichotomous variables for each of the levels of education (primary, secondary, high school, normal, technical or commercial, professional, master's and doctoral), being the reference category no instruction level. Component $\sum_{i=1}^{3} \sigma_i estrato_i$ is another vector that includes three population strata (from 2,500 to 14,999 inhabitants, from 15,000 to 99,000 inhabitants and 100,000 and more), the term $\sum_{m=1}^{2} \pi C_i$ cincludes two contract modalities (temporary and permanent), being these workers compared to those breadwinners who have no contract. The expression $\sum_{i=1}^{3} \phi_i tamemp_i$ illustrates the establishment size (small, medium and large companies), where the comparison category is the microenterprise. The term $\sum_{i}^{6} \theta_i \, \mathrm{sec}tor_i$ represents a set of binary variables for each of the

six economic sectors where the employee may work, namely: 1) agriculture, livestock, forestry, hunting and fishing, 2) mining, electricity, water and gas supplied to the final consumer via duct, 3) construction industry, 4) manufacturing, 5) Trade and 6) transport, post and storage, where these are compared to the diverse services sector. Finally the term $\sum_{i=1}^{31}\delta_i E_i$ records a set of binary variables that control for states in Mexico, the state of Chiapas being the reference entity as it presents substantial social, economic and education lags, making it a reference appropriate for comparisons.

Considering that the sample used could present an incidental truncation bias, because for some breadwinners there is no information available for the lnwi variable, we used the Heckman two-stage procedure, which consists in estimating a decision equation based on the full sample which allows to obtain consistent and asymptotically normal estimators. Note that the problem of bias arises from using a sample that considered breadwinners income for households that reported not to offer this information because they were not participating in the labor market at the time of the survey. This situation may be due, among other factors, to their reserve wage being higher than the market's and therefore they might still be job hunting. The Probit probabilistic model estimated is as follows:

$$P(s = 1/z) = \Theta(z\gamma)$$

[3]

$$s = 1[z\gamma + \upsilon \geq 0]$$

[4]

This last expression indicates that s = 1 if lnw is observed and zero otherwise, assuming that all elements are observed for x and z. Wooldridge (2006) states that x must be a strict subset of z for the method to work properly. Once the decision model is estimated and validated estimates obtained $\hat{\gamma}_i$ and the Mills ratio is calculated $\hat{\lambda}_i = \lambda(z_i\gamma)$ to proceed to the estimate equation of interest:

$$E[\text{lnwi} / z_1, z_2, \ldots . z_m, s = 1] = \hat{\alpha} + \lambda_1 x_1 + \lambda_2 x_2 + \ldots \ldots + \lambda_k x_k + \rho\lambda(z_0 + z_1\beta_1 + \ldots . + z_m\beta_m)$$

Where ***p*** is the coefficient associated to the inverse Mills ratio estimated in the decision equation [4] and corresponding to the ratio of the density function and the cumulative density function evaluated in a normal function *i*. Thereafter, this ratio (λ) is included as a regressor in the equation of interest [5]. If the estimated value of this coefficient is different from zero, then it follows that there is self-selection bias in the sample OLS estimates.

Sources of information

The information used in the econometric estimates was obtained from the National Income and Expenditure of Households 2008 Survey, which included a total of 35,146 households and was applied in urban and rural areas. The history of this instrument goes back to 1992, since then it has been applied on a regular basis and the reported results are comparable for each year. For 2008 it provides information for all municipalities. Information can also be broken down by marginalization strata as defined according to Mexico's National Population Council (CONAPO, acronym in Spanish). A methodological feature of this survey is that it has a representation at the state level, however it only delimits some states. For example, in the 2004 survey it was only representative for Mexico City and Nuevo Leon; in 2005 for Puebla, Sonora, Tabasco and Veracruz; in 2006, for Guanajuato and Veracruz; in the latest, 2008, for the State of Mexico, Mexico City, Jalisco, Guanajuato, Querétaro, Sonora and Yucatan.

The main feature of this survey and of the previous is that it gathers information on income and household spending and also provides information on other important socioeconomic indicators among which are variables related to the labor market. This survey is based on a sample design characterized by being probabilistic, stratified, single-staged and by clusters which confers it great importance in statistical terms. It should also be noted that in this process the ultimate unit of selection is the household which is also the observation unit, being representative at the national level, in rural as well as urban areas.

The variables used correspond to the population, household, income and employment database. As for the income variable hourly wages paid are used and deflated based on the consumer price index by INEGI. Potential work experience was calculated on the basis of a standard methodology that considers the age and education level of the household breadwinner. Both variables were obtained from the category that describes population sociodemographic and occupational characteristics of all household members, and the gender variable. In the second case we took into account the culminated instructional levels. Regarding the establishment size, 2008 ENIGH includes twelve categories according to the number of employees, however, considering this classification and that of the Ministry of Economy, we defined four types of establishments: micro, small, medium and large companies.

The information was obtained from the category that describes the activity status of household members. Thus the information on the economic activities of the main breadwinner was obtained, taking as reference the In-

dustrial Classification System of North America. The household size variable was obtained from the category that concentrates and refers to the number of people in the household. The population strata information for classifying the population in rural and urban areas was also obtained from the concentrated database of the survey.

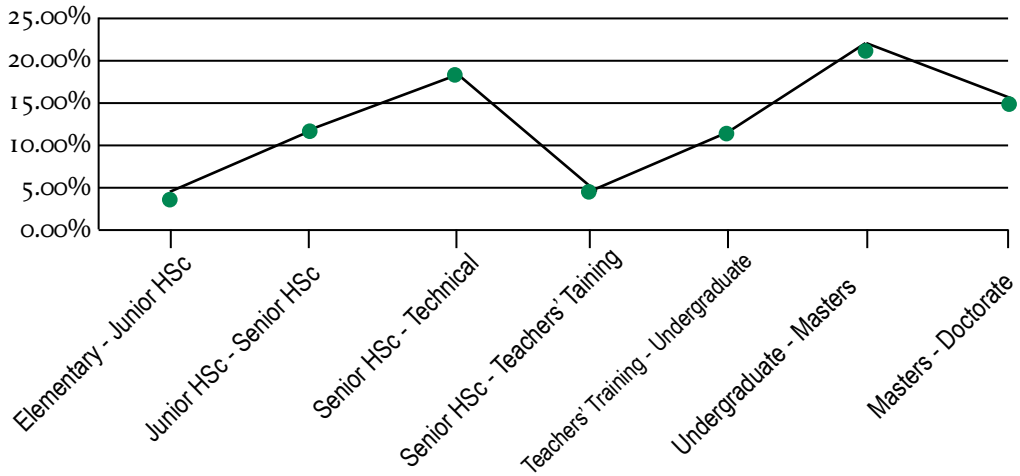
Discussion of Results

The results generated by the first model that factors work experience in a linear and quadratic way, and the vector of binary variables for each of the schooling levels, were corrected by the Heckman two-stage method and robust standard errors were obtained through the White (1980) method. The first step was to estimate a Probit model by maximum likelihood, where the dichotomous dependent variable takes the value of one if the household breadwinner participates in the labor market and zero otherwise. The explanatory variables used were work experience, work experience squared, education, gender and household size, with the first three part of **x** and this vector a strict subset of **z**.

To evaluate the joint significance of the probabilistic model we used the likelihood ratio $LR = -2\ln(\lambda) = -2(\ln L_{CR} - \ln L_{SR})$. The null hypothesis that was contrasted states that all coefficients, except the constant, are null (model with restrictions). The LR statistic is distributed according to a probability distribution with Ð2 with degrees of freedom equal to the number of restrictions, where these are equal to the number of explanatory variables involved. The decision rule shows that if inequality $prob(LR \prec \chi^2_\alpha) = 1 - \alpha$ does not apply, the null hypothesis of no significance as a model will be rejected. The value of χ^2 with α = 0.05 and 13 degrees of freedom, is equal to 22.36 and LR=1148,403, which means that the probability model is adequate.

Once the estimates have been corrected it is feasible to calculate the marginal rate of return of schooling levels. In this case we followed the Psacharopoulos (1993) methodology, based on the formula $r_i = \frac{(\beta_i - \beta_{i-1})}{n_i}$, indicating that the yield of i-th ieducational level ri can be estimated by computing the difference between the coefficients Di and Di-1, which is divided by ni i.e. the number of school years corresponding to level k. Calculations allow to state that when the breadwinner moves from primary to secondary, his or her rate of return increases by 3.6%; from secondary to high school 11.58%; from high school to a technical degree 18.05%; from high school to teacher's school 4.25%; from teachers' school to undergraduate degree 10.56%; from undergraduate to a masters degree 20.62%; from masters to Ph.D. 14.91%. The data are clear in stating that the higher profitability of education is reached once the breadwinner goes from professional to a masters (MA) degree. There is also a significant increase when moving from high school to technical education (see Figure 1), which is not fortuitous, since education provides technical skills relevant for positioning in the labor market.

Figure 1 **Schooling's rate of return, Mexico, 2008**



Source: Own design.

With respect to the coefficients of the dummy variables introduced in the models estimated, these are interpreted as percentage differences with respect to the base category. For this purpose, we use the transformation [100(exp -1)]*, which allows for more accurate results. The results generated by the model [1] allow to determine that breadwinners with a primary education level earn 34.48% more than those who do not have any education. Taking this category as a benchmark, we find that breadwinners with a junior high school diploma earn 44.82% more than those who did not have the opportunity to study. Those with a high school degree earn 112.10% more and those with a technical degree or a teachers' diploma earn 64.58% and 151.41%, respectively. Those with an undergraduate degree earn 326.35% more than those who have no degree, while those with masters and doctorate earn 543.98% and 907.24% more respectively (see Table 1). It can be seen that as household breadwinners increase their level of education they improve their income, however, the levels are most outstanding for professional, master's and doctorate.

In the case of the model [2] that integrates attributes of socioeconomic and territorial nature, it is considered that those household breadwinners residing in places with populations ranging from 2,500 to 14,999 inhabitants have earnings 19.63% higher than those living in towns with less than 2,500 inhabitants. While, those living in places with populations of 15,000 to 99,000 inhabitants earn 28.45% more and those living in geographical areas with over 100,000 inhabitants earn 41.82% more than those who live in areas with less than 2,500 inhabitants. In terms of the size of the establishment, it should be noted that the dummy va-

riables coefficients are statistically significant at the usual levels of confidence. The magnitude of the coefficients indicate that the percentage wage differences are significant, for example, breadwinners who work in a small company earn 17.75% more than microenterprise workers.

In the case of medium and large companies the percentage increase is of 17.20% and 20%, respectively, compared to the same comparison category. The results indicate that those who work in small and medium establishments remain virtually at the same wage differential with respect to those working in microenterprises. Actually, the wage gap widens when comparing companies large and micro. On average a breadwinner receives a better salary when working for a big company regardless of the economic activity, which is controlled in the model through a vector of dummy variables. Considering that large companies are generally characterized for being more productive and competitive, it could be expected that those who work in large companies require higher levels of qualification, and in this sense be paid efficiency wages, as seems to be the case.

Regarding the type of contract, the results show that breadwinners who have a temporary contract or for a specific task earn 15% more than those who do not have a signed contract. For those with a permanent contract, the coefficient denotes a 31.77% differential adjustment compared to those who have no written contract. It can be said that a permanent contract, in addition to being an indicator of job security, is also a relevant variable in wage determination which is associated with higher income. In this sense, we can say that the contractual relationship between supply and demand in the labor market determines the rules of how the parties should interact to influence the wage structure.

In terms of economic sectors there are also marked percentage differences in levels of real hourly wage. Taking services as the comparison sector, we determined that those working in the primary sector, comprising agriculture, livestock, forestry, hunting and fishing, earn 35.9% less than those employed in the service sector. While, those who work in the mining, electricity, water and gas supply sector earn 16.02% more. For those working in the construction industry, manufacturing, trade and transportation post and warehousing, receive incomes that are 4.02%, 13%, 22.45%, 15.24% respectively above those employed in the service sector. These data indicate that the mining, electricity, gas and water supply sector are the highest wages paid within the universe studied.

For the states, the adjusted coefficients suggest that there are interstate wage differences. Taking the state of Chiapas as the entity for comparison, which primary characteristic is to register one of the highest poverty levels in the country, showed the greatest differences in wages compared to Baja California, Baja California Sur, Jalisco, Queretaro, Mexico City and Chihuahua. Meanwhile, states like Guerrero, Oaxaca, Nayarit and Zacatecas show relatively minor differences in comparison to Chiapas.

This indicates that nationally there is still a scenario where income levels are clearly linked to regional economic dynamics and geographical features.

Table 1
Income and Expenditure Survey, Mexico, 2008

Model	Basic model with dummy variables								
Method	MCO*			Probit Model **			Heckman Two Stage Meth-od***		
	Coef.	Std. Err.	t	Coef.	Std. Err.	Z	Coef.	Std. Err.	t
Constant	2.8810	0.0489	58.8901	0.8817	0.0688	12.8204	3.7148	0.0622	59.7501
Experience	0.0286	0.0019	15.0864	-0.0017	0.0026	-0.6462	0.0163	0.0019	8.4324
Experience 2	-0.0002	0.0000	-7.6670	-0.0002	0.0000	-4.8573	0.0002	0.0000	5.2540
Preschool	0.3466	0.3050	1.1366	-0.0736	0.2154	-0.3416	0.4829	0.3085	1.5651
Elementary	0.2857	0.0412	6.9360	0.0336	0.0421	0.7997	0.2963	0.0398	7.4387
Junior High Sch.	0.5860	0.0438	13.3749	0.2513	0.0494	5.0844	0.4043	0.0433	9.3347
Senior High Sch.	0.8953	0.0461	19.4062	0.2278	0.0557	4.0920	0.7519	0.0454	16.5518
Technical	1.7751	0.0620	28.6533	0.6452	0.1288	5.0086	1.2936	0.0651	19.8607
Teacher's Training	1.0638	0.0531	20.0497	0.2242	0.0687	3.2622	0.9219	0.0523	17.6152
Undergraduate	1.6320	0.0460	35.5151	0.2910	0.0548	5.3133	1.4501	0.0456	31.7758
Masters	2.2017	0.0568	38.7346	0.5004	0.1069	4.6805	1.8625	0.0581	32.0661
PhD	2.4430	0.0919	26.5949	0.2525	0.2071	1.2193	2.3098	0.0925	24.9595
Gender				-0.1315	0.0285	-4.6135			
Household Size				0.0784	0.0059	13.1920			
λ							-2.8655	0.1387	-20.6595
	R^2 = 0.20, Prob(F)=0.000			estadístico LR=1148.403, Prob (LR)=0.0000			R^2 = 0.22, Prob(F)=0.000		

* White Heteroskedasticity Consistent Standard Errors & Covariance
** Robust Covariance Estimates through the Huber/White Method
*** White Heteroskedasticity Consistent Standard Errors & Covariance

Table 2
Income and Expenditure Survey, Mexico, 2008

Model with labor market and economic activity attributes						
	Ordinary Least Squares*			Heckman Two Stage Method*		
Variables	Coef.	Std. Err..	t	Coef.	Std. Err.	t
C	2.4967	0.0708	35.2759	3.6105	0.0826	43.7327
Experience	0.0237	0.0018	12.9687	0.0081	0.0019	4.3648
Experience 2	-0.0002	0.0000	-5.6584	-0.0003	0.0000	-10.3346
Preschool	0.0779	0.2762	0.2821	0.2384	0.2757	0.8648
Elementary	0.1346	0.0389	3.4608	0.1424	0.0373	3.8212
Junior High School	0.2391	0.0423	5.6522	-0.0031	0.0415	-0.0759
Senior High School	0.4432	0.0453	9.7848	0.2437	0.0442	5.5080
Teacher's Training	1.2990	0.0627	20.7295	0.6629	0.0657	10.0835
Technical	0.5767	0.0520	11.0843	0.3557	0.0510	6.9748
Undergraduate	1.0775	0.0455	23.6650	0.8220	0.0449	18.2922
Masters	1.5714	0.0569	27.6396	1.1136	0.0579	19.2418
PhD	1.7321	0.0900	19.2476	1.5251	0.0917	16.6364
Gender	0.0620	0.0204	3.0358	-0.0164	0.0203	-0.8072
2,500 to 14,999 inhabitants	0.1739	0.0293	5.9321	0.1793	0.0287	6.2522
15,000 to 99,000 inhabitants	0.2396	0.0261	9.1676	0.2504	0.0256	9.7717
100,000 inhabitants or more	0.3340	0.0230	14.5084	0.3494	0.0226	15.4724
Temporary Contract	0.1308	0.0229	5.7198	0.1398	0.0225	6.2199
Permanent Contract	0.2676	0.0172	15.5800	0.2759	0.0169	16.3225
Small Business	0.1556	0.0172	9.0367	0.1634	0.0169	9.6843
Medium Business	0.1472	0.0222	6.6420	0.1587	0.0219	7.2468
Big Company	0.1763	0.0213	8.2592	0.1802	0.0210	8.5677
Agriculture, Fishing, Forestry	-0.4222	0.0317	-13.3026	-0.4449	0.0311	-14.2882
Mining, water, domestic gas service	0.1508	0.0399	3.7840	0.1486	0.0393	3.7769
Construction	-0.0234	0.0239	-0.9795	-0.0410	0.0233	-1.7601
Manufacturing	-0.1282	0.0204	-6.2759	-0.1395	0.0201	-6.9413
Trade	-0.2419	0.0229	-10.5518	-0.2543	0.0226	-11.2524
Transport, Mail, Storage	-0.1493	0.0300	-4.9804	-0.1653	0.0295	-5.5998
Aguacalientes	0.4401	0.0893	4.9290	0.4300	0.0876	4.9079
Baja California	0.7396	0.0720	10.2671	0.7578	0.0704	10.7676

Baja California Sur	0.8419	0.0882	9.5413	0.8919	0.0882	10.1097
Campeche	0.2341	0.0933	2.5099	0.2536	0.0919	2.7592
Coahuila de Zaragoza	0.4240	0.0650	6.5213	0.4423	0.0651	6.7983
Colima	0.6380	0.0719	8.8721	0.6836	0.0706	9.6772
Chihuahua	0.4651	0.0620	7.5071	0.4942	0.0612	8.0694
Distrito Federal	0.4671	0.0531	8.7956	0.4869	0.0526	9.2482
Durango	0.3095	0.0695	4.4562	0.3004	0.0688	4.3687
Guanajuato	0.5445	0.0568	9.5904	0.5145	0.0562	9.1514
Guerrero	0.1584	0.0735	2.1564	0.1354	0.0728	1.8603
Hidalgo	0.4779	0.0712	6.7100	0.4855	0.0701	6.9225
Jalisco	0.6425	0.0542	11.8652	0.6259	0.0536	11.6752
Estado de México	0.4781	0.0527	9.0634	0.4720	0.0522	9.0491
Michoacán de Ocampo	0.4961	0.0684	7.2579	0.4816	0.0678	7.1053
Morelos	0.2330	0.0800	2.9106	0.2405	0.0784	3.0667
Nayarit	0.1310	0.1010	1.2971	0.1622	0.0995	1.6297
Nuevo León	0.4943	0.0802	6.1599	0.5210	0.0793	6.5687
Oaxaca	0.2878	0.0674	4.2691	0.2630	0.0670	3.9246
Puebla	0.1602	0.0673	2.3803	0.1457	0.0667	2.1834
Querétaro	0.6266	0.0532	11.7833	0.6207	0.0527	11.7835
Quintana Roo	0.3149	0.0811	3.8839	0.3091	0.0803	3.8501
San Luis Potosí	0.2992	0.0750	3.9887	0.2850	0.0747	3.8168
Sinaloa	0.4287	0.0798	5.3748	0.4356	0.0783	5.5649
Sonora	0.5282	0.0542	9.7423	0.5518	0.0537	10.2742
Tabasco	0.3055	0.0651	4.6914	0.3236	0.0646	5.0119
Tamaulipas	0.3789	0.0669	5.6636	0.4010	0.0655	6.1251
Tlaxcala	0.2891	0.0821	3.5208	0.2376	0.0800	2.9699
Veracruz de Ignacio de la Llave	0.2662	0.0637	4.1785	0.2944	0.0631	4.6627
Yucatán	0.3687	0.0544	6.7727	0.3804	0.0539	7.0570
Zacatecas	0.1743	0.0908	1.9184	0.1907	0.0904	2.1100
λ				-3.5643	0.1383	-25.7706
	R^2 = 0.30, Prob(F)=0.000			R^2 = 0.32, Prob(F)=0.000		

* White heteroskedasticity Consistent Standard Errors & Covariance

Conclusions

The estimation results allow us to state that investment in human capital through more formal education is an important determinant of income levels for household breadwinners in Mexico. In this sense, we can say that the improvement in the conditions of social welfare derived from higher wages is closely associated with greater access to primary, secondary and higher education, which must be of quality and linked to the dynamics of productive sectors.

The marginal rate of return calculated using the Psacharopoulos (1993) methodology shows that transitioning from one to another level of formal instruction improves the incentives for participating in the labor market. This means that when the labor force innovates and acquires professional and specialized new learnings and knowledge, deploying higher capabilities that affect productivity, competitiveness becomes the norm. This suggests that earnings are closely linked with worker capabilities and skills, which gives supply factors an important role within the labor market wage structure.

Also, it can be stated that social and territorial factors, as well as size of establishment and economic activity are relevant in determining breadwinners' income levels. It was noted that those who are employed in large establishments earn higher incomes and to a lesser extent the same is true for those who work in small and medium companies. This allows to state that demand variables associated with the type of establishment also play a role. Coupled with this, it was determined that breadwinners who have job security through a permanent contract have higher incomes, which may be associated with an accumulation of work experience, job training and development of the accumulated productive capacity.

It is also noted that there are marked differences in the incomes associated to the different states in Mexico, which may indicate a new level in the productive configuration linked with a sector structure and its socioeconomic environment. In this sense it is important to encourage the growth of local economies according to their productive and competitive vocations, as this would help to extend the possibilities of well paid employment and strengthening labor markets through education, training and specialization policies for stimulating labor productivity and production efficiency.

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